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Research article/Araştırma makalesi

Contributions to fish fauna of the Ilıca River (Fatsa/Turkey)

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Abstract

This research was performed in the Ilıca River located in Fatsa (Ordu) between 2014 and 2015 years. The fish samples that brought to the laboratory by catching randomly with electroshocker from six stations in the Ilıca River were defined according to meristic and morphometric features. Thus, it was determined six cyprinid species, *Capoeta banarescui* Turan, Kottelat, Ekmekçi & İmamoğlu, 2006, *Rhodeus amarus* (Bloch 1782), *Alburnus derjugini* Berg, 1923, *Vimba vimba* (Linnaeus, 1758), *Barbus tauricus* Kessler, 1877 and *Squalius orientalis* Heckel, 1847; two species of Family Gobiidae: *Neogobius fluviatilis* (Pallas, 1814) and *Ponticola turani* (Kovačić & Engin, 2008), and also one species of Salmonidae family, *Salmo rizeensis* Turan, Kottelat & Engin, 2010 in the Ilıca River. Five identified species in this study were as follows. *A. derjugini, R. amarus, S. orientalis, P. turani* and *S. rizeensis*, are new record for Ilıca River.

Key words: Ilıca River (Fatsa), taxonomy, inlandwater fishes, biodiversity, new record

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Ilıca Irmağı (Fatsa/Ordu)'nın balık faunasına katkılar

Özet

Bu Araştırma 2014-2015 yılları arasında Ilıca Irmağı (Fatsa/Ordu)'nda gerçekleştirilmiştir. Çalışmada altı istasyondan elektroşokerle rastgele örnekleme yöntemi ile yakalanarak laboratuvara getirilen balık örneklerinin türleri meristik ve morfometrik özelliklere göre belirlenmiştir. Ilıca Irmağı'nda Cyprinidae familyasından *Capoeta banarescui* Turan, Kottelat, Ekmekçi & İmamoğlu, 2006, *Rhodeus amarus* (Bloch 1782), *Alburnus derjugini* Berg, 1923, *Vimba vimba* (Linnaeus, 1758), *Barbus tauricus* Kessler, 1877 ve *Squalius orientalis* Heckel, 1847 olmak üzere altı tür, Gobiidae Familyasından *Neogobius fluviatilis* (Pallas, 1814) ve *Ponticola turani* (Kovačić & Engin, 2008) olmak üzere iki tür ile yüksek kesimlerdeki istasyondan da Salmonidae familyasından *Salmo rizeensis* Turan, Kottelat & Engin, 2010 tespit edilmiştir. Bu çalışmada tespit edilen beş tür *A. derjugini, R. amarus, S. orientalis, P. turani* ve *S. rizeensis* Ilıca Irmağı için yeni kayıttır.

Anahtar kelimeler: Ilıca Irmağı (Fatsa/Ordu), taksonomi, iç su balıkları, biyoçeşitlilik, yeni kayıt

1. Introduction

It is known that almost 71 percent of the planet's surface is submerged beneath seawater and 97.54% of it is composed of ocean and sea (≅352 million km^2) (Day, 2008). It is observed that the richness of the species in the inland waters is much more when compared in terms of fish species diversity, If the attainable freshwaters of rivers, lakes and spring waters only cover about 1% of the earth (1.5 million km^2) (Shiklomanov, 1993). By looking at the world as a whole, it is reported that there are more than 32000 species of fish living in freshwater and sea regardless of the

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distribution according to the habitats. However, it has been recorded that only 43% of totality is the fish species living in the inland waters (Nelson et al., 2016). Looked at the change in the number of fish species in the World according to data at the end of January 2017, the current number of species has been seen to be 34218 by added 7436 species in the last 20 years (Eschmeyer and Fong, 2017). Fish species number of inland waters in Turkey corresponds to approximately 3% of the totality according to Nelson et al (2016). Although this rate in totality does not make change much for freshwater fishes today, it was reported that this number changed between 368 and 377 according to two works (Kuru et al., 2014; Çiçek et al., 2016).

According to the official records, there are approximately 21 streams and 7 lakes/ponds in Ordu province. There are some faunistic studies approx. 22% of the inland waters as Melet River, Turnasuyu Brook, Curi stream, Yalıköy Stream and Elekçi River which were carried out by Turan et al., 2008; Bostancı et al., 2015; Bostancı et al., 2016a; 2016b and Yılmaz, 2016, respectively. In these studies, it was reported that there are 11 species mainly from Cyprindae family, 4 species from Gobiidae family, and 1 species from Mugilidae, Bilennidae and Salmonidae families. This study was aimed to contribute to the fish fauna of Ilıca River, which one of the rivers flowing into the Black Sea in the city of Fatsa.

2. Materials and methods

In the study, the fish specimens were sampled with the electroshock device and gill-nets (Emiroğlu et al., 2013) in the area between the coordinates of 41° 0.003' N - 37° 33.870' E and 40° 54.863' N - 37° 37.927' E in the Ilıca River in Fatsa County of Ordu Province (Figure 1).

At least 10 fish specimens were taken from each species caught in six stations between April-May, September-October in 2014 and 2015. The taxonomic classification of fish species was done in agreement with the descriptions of Van Der Laan et al. (2014), Nelson et al. (2016), Eschmeyer and Fong (2017), and GBIF (2017).

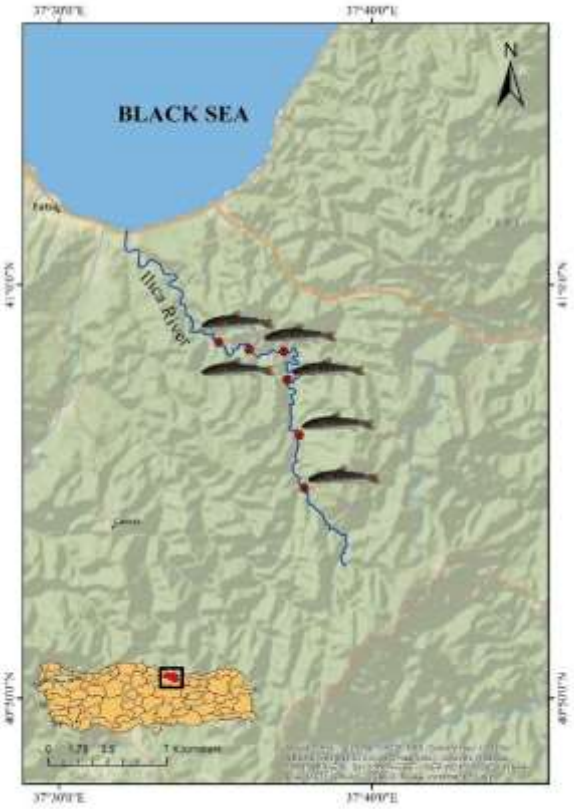

Figure 1. Overview map and sampling stations on the Ilıca River

After sampling, fish specimens were fixed in a 4% formaldehyde solution for species identification. Later, some meristic and morphometric characters of fishes were measured (Moyle and Cech, 2003; Bănărescu and Bogutskaya, 2003; Kottelat and Freyhof, 2007; Petrtýl et al., 2014). It was used meristic (countable) and metric (mm) characters with abbreviations in this study, as follows: Dorsal fin rays (D), Anal fin rays (A), Pectoral fin rays (P), Pelvic fin rays, Lateral line (LL); Total Length (*Tl*), Fork Length (*Fl*), Standard Length (*Sl*), Predorsal distance (*pD*), Length of head (*lc*), Snout length (*prO*), Horizontal diameter of eye (*Oh*), Postorbital distance (*poO*), Dorsal head length (*Dhl*), Length of Pectoral Fin (*lP*), Depth of dorsal fin (*hD*), Length of dorsal fin base (*lD*), Postdorsal distance

(*poD*), Prepelvic distance (*pV*), Length of pelvic fin (*lV*), Preanal distance (*pA*), Depth of anal fin (*hA*), Length of anal fin base (*lA*), Length of caudal peduncle (*lpc*), Depth of caudal peduncle (*hpc*), Body depth (*H*), Interorbital distance (*io*).

The morphometric and meristic measurements of the fish specimens obtained in the study were rated as percentage according to the standard height (*Sl*) and length of head (*lc*) (Bănărescu and Bogutskaya, 2003; Kottelat and Freyhof, 2007). Depending on the age, the size of the fish also varies. However, when proportions (for example, head length/standard length) are made between various morphometric characters, it allows biometric comparisons of fish. These give us a lot of information about them. For example, although rates of fins by head-to-body may be smaller in many fish, they may be larger in especially benthic fishes (Anonymous, 2014). Some scientists have used same rates for the biometric characters of the species in the ichthyofaunistic studies which performed. This morphometric ratios such as standart length/body depth (*Sl*/*H*), standart length/length of head (*Sl/lc*), length of head/ horizontal diameter of eye (*lc/Oh*), length of head/ interorbital distance (*lc/io*), interorbital distance/ horizontal diameter of eye (*io/Oh*) were shown according to Torcu and Mater (2000) and compared the relevant literature (Tables 1, 2 and 3).

3. Results

Familia: Cyprinidae

***Capoeta banarescui* Turan, Kottelat, Ekmekçi & İmamoğlu, 2006**

English names: Colchic scraper, Banarescu's barb, **Turkish Name:** Siraz Balığı

Capoeta banarescui is cyprinid known to live intensely in Turkey. It is only known from northeast Turkey from the Çoruh River system, which drains through Georgia and Black Sea. It was distinguished from *Capoeta tinca* (Anatolian khramulya) as an independent species in 2006 (Turan et al., 2006) (Figure 2-A).

Some morphometric lengths of species obtained from Ilıca River were given in Table 1 and 2. In addition to the metric data represented in Table 1, the meristics of Colchic scraper, *C. banarescui*, were identified as D II 8, A I 5-6, P 9-10, V 7-8, LL 70-93. The average ($\bar{x}$± SD), minimum and maximum values of standard lenght (*Sl*) obtained from the 12 specimens in the study result is as follows: 99.25 ± 3.23 mm, 75 mm and 115 mm, respectively. Lengths of barbels that are unique to this species have been measured; the average posterior mustache length was 5.83 ± 0.12 mm and anterior was 4.96 ± 0.04 mm. Moreover, ratios of some morphometric characters in *C. banarescui* samples are given in Table 3.

***Alburnus derjugini* Berg, 1923**

English name: Georgian shemaya **Turkish Name:** Çıra balığı

A. derjugini was encountered abundantly in the fastest flowing parts of the Ilıca River. In addition to the metric data defined in Table 1, the meristic caharacters of Georgian shemaya, *A. derjugini*, were identified as D I 8-9, A I 13-14, P 13-14, V 9-10, LL 61-69 (Figure 2-B).

***Rhodeus amarus* (Bloch 1782)**

English name: European bitterling, **Turkish Name:** Acı Balık

Rhodeus amarus is a temperate freshwater fish. It originates in Europe, ranging from the Rhone River basin in France to the Neva River in Russia (Kottelat and Freyhof, 2007).

The morphometric measurements of the *R. amarus* (Figure 2-C) sampled from the ponds mostly in the lower parts and the waterfall-like flows parts of the Ilıca River were indicated in Tables 1, 2 and 3. It was determined the *Sl* of the male specimens (n=5) were 53.80 ± 1.81 mm while the *Sl* of the females (n=7) were 51.57 ± 1.14 mm, slightly smaller than those of males. The meristics of the specimens were also identified as D I 9-10, A I 8-9, P 8-10, V 7-8, LL 35-39.

Due to having distinctive morphological characteristics female and male individuals were described easily. As shown in Figure 2-C, the color of the females is more matt gray than that of the males, and fistula-like tubercles extending from the operculum to the tip of the nose was determined.

***Vimba vimba* (Linnaeus, 1758)**

English Name: Vimba bream **Turkish name**: Eğrez balığı

Vimba vimba is a freshwater fish species belonging to the family of carp (Figure 2-D). Metric data for the *V. vimba* sampled in the study are represented in Tables 1, 2 and 3. In other words, the characters that can be counted as meristics are D I-III 8-9, A I-III 15-18, P I 14-16, V II 9-10.

***Barbus tauricus* Kessler, 1877**

English Name: Crimean barbel **Turkish name**: Bıyıklı balık

Specimens of *Barbus tauricus*, one of the relatively common fish of the Ilıca River, were caugth from the rapids. The metric data of *B. tauricus* (Figure 2-E) sampled from the Ilıca River in this study are shown in Tables 1, 2 and 3. The meristic data of Crimean barbels were determined as D I 8, A III 5-6, P 11-14, V 8-9, LL 50-58.

***Squalius orientalis* Heckel, 1847**

English Name: Chub, **Turkish Name:** Kasnak

S. orientalis shown in Figure 2-F is an economic fish and relatively abundant inhabitants of the Ilıca River. Morphological measurement results of *S. orientalis* are given in Tables 1 and 3. Its meristic characters were also determined as D I 7-8, A I 8-10, P 12-16, V 9-10, LL 41-45.

According to the results of metric measurements of *S. orientalis* (Table 1), the mean ($\bar{x}$±SD), minimum and maximum values of standard length (*Sl*) and average was found to be 107.25 ± 3.93 mm, 132.00 mm and 91.00 mm, respectively. The mean percents of some morphological measures according to *Sl* and *lc* were pointed out in Table 2. As some calculated ratios of morphometric measurements obtained from *S. orientalis*, they were demonstrated in Table 3.

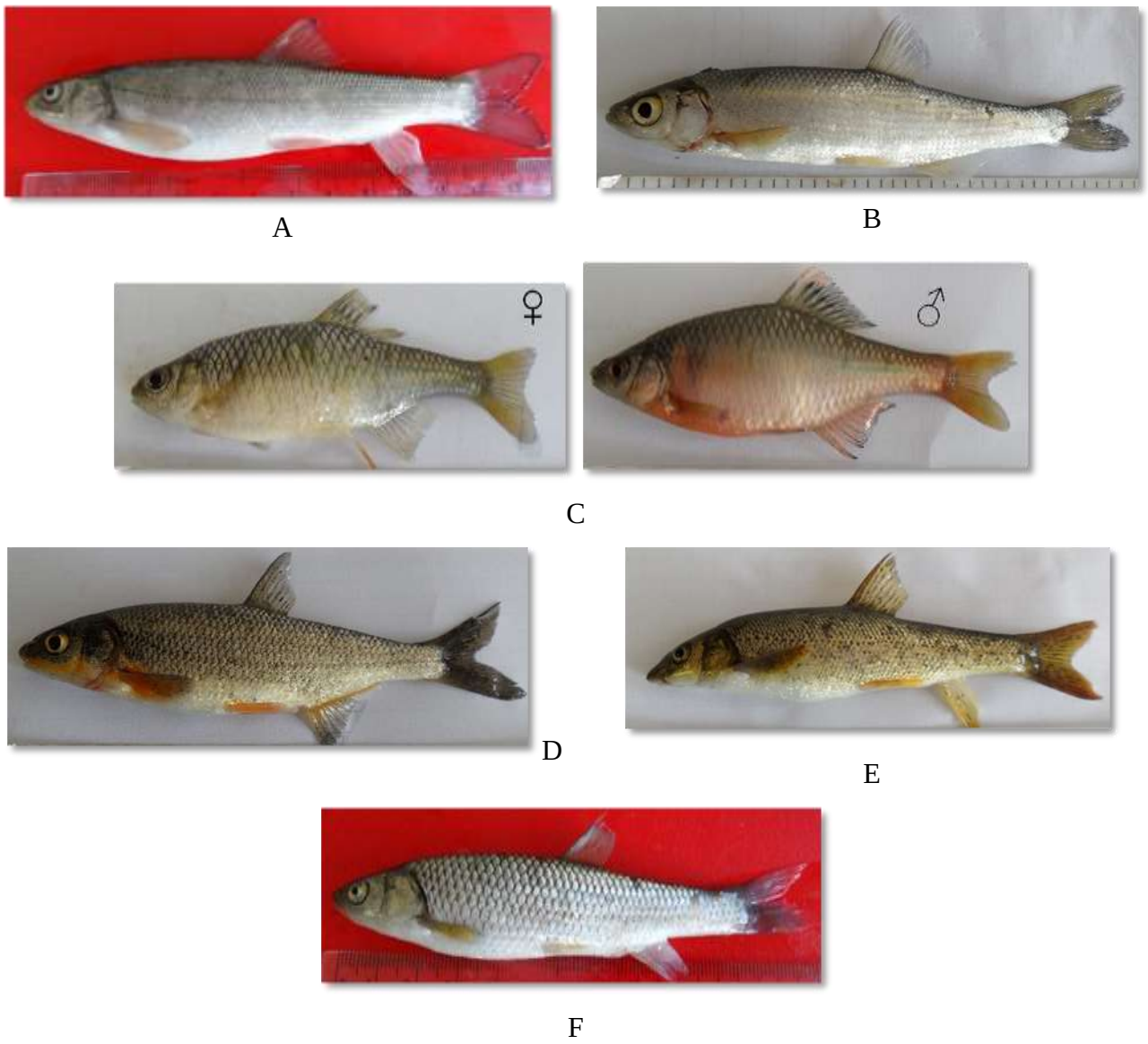

Figure 2. Cyprinid species sampled from the Ilıca River. A- *Capoeta banarescui*, B- *Alburnus derjugini*, C- *Rhodeus amarus* (female in left side and male in right side), D- *Vimba vimba*, E- *Barbus tauricus*, F- *Squalius orientalis*

Familia: Gobiidae

***Neogobius fluviatilis* (Pallas, 1814)**

English name: Monkey goby, **Turkish Name:** Kaya balığı

The specimens of *Neogobius fluviatilis* was caught in the sandy and muddy, stagnant and unflowed parts of the Ilıca River**.**

In the study, *Neogobius fluviatilis* was often found in sandy and muddy parts of the Ilıca River along with the other goby species, *Ponticola turani*. While some of the morphometric features obtained in the study were reported in Tables 1, 2 and 3, the meristic characters were determined to be D1 5-6, D2 14-18, A 11-15, P 15-17, V 8-10 (Figure 3-A). Colors from head to tail are dominanted a yellowish brown pattern in dorsal side and upper side of lateral, a golden yellow color behind the gills, and a white color on the ventral side.

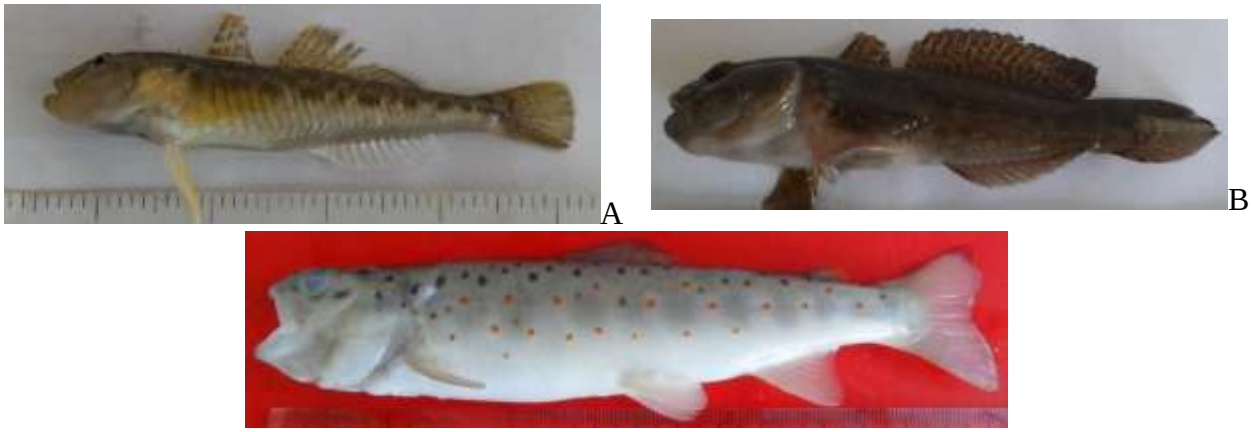

Figure 3. Some species belonging to Gobiidae and Salmonidae obtained from the Ilıca River. A- *Neogobius fluviatilis,* B- *Ponticola turani,* C- *Salmo rizeensis*

Subfamilia: Benthophilinae

***Ponticola turani* (Kovačić & Engin, 2008)**

English name: Aksu goby**, Turkish name:** Kaya balığı

Ponticola turani is a Ponto-Caspian species that lives in Turkey only endemic at the Aksu stream (Kovačić and Engin, 2008). For this reason, this species is the new record for the Ilıca River. Some metric data for the fish samples obtained in our study are remaked in Tables 1, 2 and 3. The colors of Aksu goby are darker and darker than the *N. fluviatilis*, and the white color is dominant in the ventral region from the bottom of the gills to the anus. Meristic characters of this goby species were found to be D1 5-7, D2 15-18, A 12-14, P 15-19, V 7-12 (Figure 3-B).

Familia: Salmonidae

***Salmo rizeensis* Turan, Kottelat & Engin, 2010**

English Name: Rize trout, **Turkish name:** Kırmızı benekli alabalık

Salmo rizeensis is a species distributed in the headwaters and upper reaches of the streams and rivers flowing into the Black Sea along the coast between the Çoruh River Basin in the east and the Sakarya River Basin in the west in Turkey (Turan et al., 2009).

Meristic characters of trouts were found to be D 11, A 9-11, P 12-14, V 8-9. According to the results of the morphometric measurements of *S. rizeensis* obtained in the study (Figure 3-C), the mean ($\bar{x}$ ± SD), minimum and maximum standard length of young trouts cought from this river were determined to be 53.33 ± 1.42 mm, 43.00 mm and 64.00 mm, respectively. The ratios ranges of some morphological measures were shown in Table 2 and 3.

4. Conclusions and discussion

In a previous work, it was recorded eleven species (*Salaria fluviatilis, Alburnus chalcoides, Barbus tauricus, Capoeta banarescui, Rhodeus sericeus Squalius cephalus, Vimba vimba, Neogobius cephalarges, Neogobius fluviatilis, Mugil cephalus, Salmo labrax*) in Ilıca River. But in this study, five new record species were also determined *Alburnus derjugini, Rhodeus amarus, Squalius orientalis, Ponticola turani, Salmo rizeensis* for the Ilıca River in addition to *B. tauricus, C. banarescui, V. vimba, N. fluviatilis* in the previous this research. However, as a result of this research, it was determined nine different species lived in the Ilıca River.

Capoeta species is reported to be one of the most common species in Turkish freshwaters (Kuru et al., 2014; Çiçek et al. 2015). The *C. banarescui* found in Ilıca and Yalıköy (Ordu) streams studied in the former research have also been identified in this study. However, *C. banarescui* were also reported to be present in other streams and dam lakes of Turkey, as in the Çoruh River (Turan et al., 2006), Lower Melet River/ Ordu (Turan et al., 2008), Aksu Stream/ Giresun, İyidere/ Rize (Kovačić and Engin, 2008), Almus Dam Lake Basin/ Tokat (Kaymak et al., 2012), Çoruh River/ Erzurum (Bayçelebi et al., 2015), Turnasuyu Stream/ Ordu (Bostancı et al., 2015), Yanbolu and Solaklı Stream/Trabzon (Aksu et al., 2015). According to Table 3, the metric proportions calculated in this study are similar to those obtained from morphometric data of *C. banarescui* as reported in a study, Bostancı et al. (2015) and Bostancı et al. (2016a). In Table 4, it is seen that the results of species from the *Capoeta* genus studied by Özdemir (2015) is compatible with all ratios except the % predorsal distance according to *Sl* of *C. banarescui*. When compared to *C. turani* (Schöter et al., 2009) found in the Göksu River, it was found from which ratios of *C. banarescui* differs in terms of % *H*, % *poD* and % *hD* rates according to *Sl* and % eye diameter according to *lc*.

Barbus tauricus, which is found formerly in Ilıca River, has also been identified in this study. Although the natural distribution area is the Crimean Peninsula (Kottelat and Freyhof, 2007), Crimean barbus has been also distributed in the freshwaters of the Black Sea region of Turkey according to studies conducted. The presence of *B. tauricus* has been reported in recent studies (Bostancı et al., 2015; Bostancı et al., 2016a; Bostancı et al., 2016b; Yılmaz, 2016) in inland

waters of Ordu province (Turnasuyu Stream, Curi Stream, Yalıköy Stream and Elekçi River). Crimean barb specimens were defined in freshwaters of Samsun Province in Black Sea Region (Uğurlu and Polat, 2006; 2007; 2008a; 2008b). *B. tauricus escherichi* is stated being a subspecies of Crimean barbel has been also reported in İznik Lake/ Bursa (Özuluğ et al., 2005), Hopa stream/Artvin (Turan et al., 2005), freshwaters of Biga Peninsula (Sarı et al., 2006) and inland waters of Western Black Sea region (İlhan and Balık, 2008). Subspecies *B. t. escherichi* expressed in some of these studies have been accepted as *B. tauricus* (Froese and Pauly, 2016). Looked at some morphometric ratios in Table 3, in terms of the *Sl*/*H* and *io*/*Oh* ratios of *B. tauricus* determined in this study, there is a marked difference from the results of Bostancı et al. (2015), Bostancı et al. (2016a) and Uğurlu and Polat (2008b), whereas indicated very similarities with the results of Yılmaz (2016). All the data except the length of caudal peduncle (*lpc* %) from % morphometric ratios as the *Sl* in Table 4 were seen to be compatible with the result of the three examination (Bănărescu and Bogutskaya, 2003) carried out. As demonstrated in Table 4, some % morphometric ratios (*lc, H, pD* and *poD*) to *Sl* of *B. tauricus* indicated by Verep et al. (2006) are similar to those obtained in this study. Today all subspecies of *B. tauricus* were accepted as synonymous (Eschmeyer and Fong, 2017).

Occurrence of *Alburnus derjugini* was reported in the Çoruh River by Bayçelebi et al. (2015). Besides, this species obtained in this study is new record for Ilıca River. Compared with some morphometric ratios of *A. derjugini* described in this study (Table 4) and new species described in Turkish freshwaters (*A. demiri*, *A. attalus* and *A. battalgilae*) (Özuluğ and Freyhof, 2007a; Özuluğ and Freyhof, 2007b), it was understood that there were significant differences in the anal fin base (*lA*%) values according to *Sl* and eye diameter (*Oh*%) according to head length (*lc*) only.

It has seen commonly species belonging to *Vimba* genus in inland waters of Turkey. As in this and previous study performed in Ilıca River, there are also records for this species in many faunistic and ichthyological investigations in Turkey: Terice, Göksu, Miliç and Terme Streams/ Samsun (Uğurlu and Polat, 2005; 2006; 2007), Lower Melet River/ Ordu (Turan et al., 2008), Karaabdal Stream/ Samsun (Uğurlu and Polat, 2008b), Bafra Fish Lakes/ Samsun (Uğurlu et al., 2008), Durusu Lake/ İstanbul (Özuluğ, 2008), Marmara Lake/ Manisa (İlhan and Sarı, 2013), Gönen Creek/ Balıkesir (İlhan et al., 2014), Turnasuyu Stream/ Ordu (Bostancı et al., 2015), Curi Stream/ Ordu (Bostancı et al., 2016a), Elekçi River/ Ordu (Yılmaz, 2016). In some studies *V. vimba tenella*, reported as subspecies, has now been reported to be *V. vimba* as a species (Froese and Pauly, 2016). According to Table 3, morphometric ratios of *Vimba* is seen that this study's results as the ratios are not compatible with the other nine studies except for *Sl/H* and *lc*/*Oh*. However, it is very similar with findings by Bostancı et al. (2015) and Bostancı et al. (2016a).

As seen in Table 3, the *lc*/*io* ratios calculated in this study are not different from the other studies (Uğurlu and Polat, 2006; Uğurlu and Polat, 2008a; Uğurlu et al., 2008; Bayçelebi et al., 2015) except the results of Uğurlu and Polat (2007).

Squalius genus has many species in terms of its distribution in the Turkish inland waters. *Squalius orientalis* determined in this study is the first record for Ilıca River, but also found few numbers in Çoruh River (Bayçelebi et al., 2015), Yanbolu and Solaklı Stream (Aksu et al., 2015). In following years, Kaya et al. (2016) treated upper Tigris populations as *Squalius* sp. It is understood from Table 4 that the *S. carinus* and *S. cii* species and *S. orientalis*, which are detected as new endemic species in the *Squalius* genus, have significant differences in the *lc* gore *Oh*% and *io*% values (Özuluğ and Freyhof, 2011).

It was reported that there is only one strand of *Rhodeus* genus in Turkey: *Rhodeus amarus* (Bogutskaya and Komlev, 2001). In this study, it is determined that *R. amarus* is a bitterling species in the Ilıca River, as new record for this river. It is seen from the works done that *R. amarus* is widely found in Turkey's geography. It was reported to be found in the western part of Turkey, such as Marmara Lake/ Manisa (İlhan and Sarı, 2013), Büyük Menderes River (Güçlü et al., 2013) and Gönen Stream/ Balıkesir (İlhan et al., 2014). *R. amarus* newly accepted species has been reported as *R. sericeus* in some studies carried out in some rivers flowing into Black Sea: Miliç River/ Samsun (Uğurlu and Polat, 2006), Engiz River/ Samsun (Uğurlu and Polat, 2008a), Yalıköy Stream/ Ordu (Bostancı et al., 2016a), Elekçi River/ Ordu (Yılmaz, 2016).

Neogobius fluviatilis, which is common in Ilıca River was also found some studies performed from different localities in Turkey: Mert River/Samsun (Uğurlu Helli and Polat, 2002), some streams of Biga Peninsula rivers/ Çanakkale (Sarı et al., 2006), Miliç River/ Samsun (Uğurlu and Polat, 2006), Terme Stream/ Samsun (Uğurlu and Polat, 2007), Aksu Stream/ Giresun (Kovačić and Engin, 2008), some freshwaters in West of the Black Sea (İlhan and Balık, 2008), Engiz River/ Samsun (Uğurlu and Polat, 2008a), Durusu Lake/ Istanbul (Özuluğ, 2008), Gönen Stream/ Balıkesir (İlhan et al., 2014), Yalıköy Stream/ Ordu (Bostancı et al., 2016a), Elekçi River/ Ordu (Yılmaz, 2016).

Given the rates associated with *Neogobius fluviatilis*, it was seen that the rates of *Sl*/*lc* and *lc*/*io* are clearly different from the results of our previous studies, according to Table 3. While it is in full agreement with the other results except % *lA* from % morphometric ratios according to *Sl* for *N. rizeensis* by Kovačić and Engin (2008), most of % data (*prO, oh* and *poO*) compared as *lc* (Table 4) denote to be significantly different from ours.

While Kovačić and Engin (2008) described firstly Genus *Neogobius* when the goby species was defined as *Neogobius turani* sampled from Aksu Stream in Giresun, this genus today is accepted to be *Ponticola* which is a subgenus by the taxonomic authorities (Capuli and Bailly, 2016; Eschmeyer and Fong, 2017). Four species belonging to the genus *Ponticola* living in the inland waters of Turkey were identified in studies conducted, below. *Ponticola turani*, a new record species for the Ilıca River, identified in this study. The other species of *P. constructor*, *P. rizensis* and *P. cyrius* were reported to be found in Çoruh River/ Artvin (Bayçelebi et al., 2015), Yanbolu and Solaklı Streams/Trabzon (Aksu et al., 2015) and the Kura-Aras River Basin (Çiçek and Birecikligil, 2016), respectively. Only % *lpc* within morphometric ratios by standard length (*Sl*) belonging to specimens of *P. turani* determined in the Ilıca River were significantly different in this study when compared to the *N. turani*'s (Table 4) (Kovačić and Engin, 2008).

It was reported that Species of *Salmo rizeensis* firstly found in Ilıca River in this study has been widely seen in the Çoruh River (Turan et al., 2009; Bayçelebi et al., 2015) and along the Black Sea coast of Turkey (Turan et al., 2009). *S. macrostigma*, once known as the subspecies of brown trout (*Salmo trutta*) in the Mediterranean and suggested that is very similar to *S. rizeensis* in Turkey, is an endemic salmonid in freshwater in Northwest Africa (Kottelat, 1997; Delling and Doadrio, 2005; Kottelat and Freyhof, 2007; Luna and Geelhand, 2016) However, this species is proved to be *S. rizeensis* by (Turan et al., 2009) although *S.* (*trutta*) *macrostigma* reported to be found in many places of Turkey in many studies conducted.

Table 1. Some morphometric lengths of species obtained from Ilıca River; $\bar{x}$: mean, ±: Standard deviation, *m*: Minimum, M: Maximum

Species		*Sl*	*pD*	*lc*	*prO*	*Oh*	*poO*	*Dhl*	*lP*	*hD*	*lD*	*poD*	*pV*	*lV*	*pA*	*hA*	*lA*	*lpc*	*hpc*	*H*	*io*
Capoeta banarescui	$\bar{x}$	99.25	52.58	25.33	8.46	6.75	13.13	21.17	21.46	23.00	15.08	39.17	55.25	18.71	75.42	21.75	9.67	19.75	12.58	22.00	11.00
	±	3.23	1.82	0.97	0.27	0.11	0.35	0.48	0.94	1.06	0.78	1.39	1.72	0.73	2.57	1.14	0.34	0.67	0.36	0.79	0.37
(n=12)	*m*	75.00	40.00	21.00	7.00	6.00	12.00	18.00	15.00	18.00	12.00	29.00	43.00	14.00	58.00	16.00	7.00	16.00	10.00	17.00	8.00
	M	115.00	65.00	35.00	10.00	7.00	16.00	24.00	25.00	33.00	23.00	46.00	65.00	24.00	92.00	30.00	11.00	24.00	15.00	27.00	13.00
Barbus tauricus	$\bar{x}$	90.92	48.00	24.88	11.04	6.67	11.54	22.04	18.75	20.46	13.88	36.96	50.21	18.00	69.33	18.21	9.25	19.92	11.42	20.29	9.42
	±	2.26	1.21	0.60	0.29	0.14	0.27	0.47	0.45	0.42	0.34	0.76	1.31	0.34	2.03	0.78	0.17	0.43	0.23	0.46	0.23
(n=12)	*m*	80.00	41.00	22.00	10.00	6.00	10.50	20.00	17.00	19.00	12.00	32.00	44.00	16.50	60.00	15.00	8.50	18.00	10.00	18.50	8.00
	M	104.00	55.50	29.00	13.00	7.50	14.00	25.00	21.50	23.00	16.50	41.00	57.00	20.00	82.00	23.00	11.00	23.00	13.00	23.50	10.50
Rhodeus amarus	$\bar{x}$	52.50	30.67	14.79	5.46	6.00	7.67	12.46	11.04	11.71	12.58	18.29	26.88	10.25	34,92	10,46	10,92	15,83	8,00	21,29	6,96
	±	1.30	0.78	0.34	0.17	0.12	0.27	0.30	0.34	0.31	0.46	0.42	0.49	0.25	0,99	0,38	0,39	0,57	0,26	0,57	0,14
(n=12)	*m*	46.00	26.00	12.00	4.00	5.50	6.00	11.00	9.00	9.00	10.00	16.00	25.00	9.00	29,00	8,00	9,00	12,50	7,00	19,00	6,00
	M	62.00	35.00	17.00	6.00	7.00	9.00	14.00	13.00	13.00	16.00	20.00	30.00	12.00	41,00	13,00	14,00	19,00	10,00	26,00	8,00
Alburnus derjugini	$\bar{x}$	90.67	51.67	23.92	8.08	8.46	11.50	17.42	18.21	17.54	13.38	33.58	45.04	14.08	62.71	13.21	17.67	19.54	9.58	19.54	8.58
	±	3.18	1.93	0.63	0.32	0.17	0.62	0.34	0.58	0.54	0.55	1.19	1.48	0.34	2.30	0.30	0.47	0.56	0.32	0.70	0.28
(n=12)	*m*	79.00	42.00	21.00	6.00	7.50	8.50	15.00	15.00	15.00	11.00	29.00	40.00	12.50	55.00	11.50	15.50	16.00	8.00	16.50	7.00
	M	112.00	63.00	27.50	10.00	9.50	17.00	19.00	21.00	21.00	17.50	40.00	56.00	16.50	78.00	15.00	20.00	23.00	12.00	24.00	10.00
Vimba vimba	$\bar{x}$	96.20	52.35	26.80	9.85	8.10	13.30	21.40	19.10	21.85	14.15	38.70	51.85	15.95	68.05	15.70	20.25	16.75	10.85	26.15	10.45
	±	10.45	5.59	2.69	0.81	0.68	1.18	1.88	1.62	2.17	1.28	3.72	5.04	1.40	6.63	1.41	1.72	1.40	1.22	2.20	1.32
(n=10)	*m*	76.00	41.00	22.00	8.00	7.00	11.00	17.00	15.00	17.00	11.00	32.00	41.00	11.00	55.50	11.00	14.00	15.00	9.00	21.50	9.00
	M	110.00	61.00	30.00	11.00	9.50	18.00	24.50	21.00	25.50	16.50	44.00	59.00	19.00	80.00	19.00	22.00	19.00	13.00	30.00	12.00
Squailus orientalis	$\bar{x}$	107.25	59.25	30.25	9.38	8.17	16.67	22.00	20.08	21.04	13.25	41.29	56.00	17.63	76.50	17.75	13.63	25.75	14.08	25.08	13.33
	±	3.93	2.04	1.10	0.30	0.25	0.68	0.57	0.80	0.68	0.61	1.71	1.80	0.69	2.60	0.49	0.75	1.09	0.49	0.94	0.42
(n=12)	*m*	91.00	50.00	26.00	7.50	7.00	13.50	19.00	16.50	17.00	11.00	33.00	48.00	14.50	65.00	15.00	10.50	21.00	12.00	19.00	11.00
	M	132.00	74.50	39.00	11.50	9.50	21.00	25.50	25.50	26.50	18.00	50.00	66.00	23.00	92.00	22.00	18.00	32.00	17.00	31.00	15.00
Salmo rizeensis	$\bar{x}$	53.33	27.50	16.25	4.83	5.71	9.96	12.38	12.33	11.50	9.96	25.88	32.04	10.29	42.96	10.08	7.92	12.13	6.96	13.29	5.83
	±	1.42	0.63	0.40	0.18	0.09	0.31	0.28	0.30	0.39	0.32	0.53	0.74	0.58	0.98	0.22	0.23	0.47	0.21	0.39	0.19
(n=12)	*m*	43.00	25.00	13.00	4.00	5.00	8.00	10.50	11.00	8.00	8.00	23.00	28.00	8.00	38.50	9.00	6.00	10.00	6.00	11.50	5.00
	M	64.00	33.00	18.00	6.00	6.00	12.00	14.00	15.00	14.00	12.00	29.00	38.00	16.00	50.00	11.00	9.00	15.00	8.50	16.50	7.00

Table 1. (*Continued*)

Species		*Sl*	*pD1*	*pD2*	*lc*	*prO*	*Oh*	*poO*	*Dhl*	*lP*	*hD1*	*hD2*	*lD1*	*lD2*	*poD1*	*poD2*	*pV*	*lV*	*pA*	*hA*	*lA*	*lpc*	*hpc*	*H*	*io*
Neogobius	$\bar{x}$	86.60	30.20	43.80	26.65	10.15	6.85	14.55	13.10	20.15	15.40	14.35	12.55	32.30	50.40	19.00	29.05	17.40	49.40	10.60	27.55	16.55	8.30	15.80	5.55
fluviatilis	±	3.25	0.99	1.96	0.98	0.39	0.16	0.77	0.42	0.70	0.82	0.55	0.65	1.62	2.00	0.80	0.92	0.62	2.09	0.31	1.17	0.63	0.51	0.79	0.33
(n=10)	*m*	68.00	25.00	32.00	22.00	8.00	6.00	11.00	11.00	16.00	10.00	12.00	8.50	25.00	40.00	14.00	24.00	15.00	40.00	8.00	21.00	13.00	6.00	12.00	4.00
	M	105.00	34.00	54.00	32.00	12.00	7.50	18.00	15.00	23.00	18.00	17.50	15.50	41.00	60.00	22.00	33.00	22.00	60.00	11.50	34.00	20.00	12.00	21.00	7.00
Ponticola	$\bar{x}$	76.33	28,33	38.50	25.25	8.13	6.71	14.00	12.29	18.33	11.71	11.92	11.58	30.21	36.75	18.33	23.79	14.75	45.71	9.79	20.75	16.04	9.46	15.50	4.17
turani	±	3.83	0,98	1.20	1.00	0.37	0.14	0.67	0.37	0.83	0.55	0.52	0.55	0.98	3.10	2.91	0.76	0.52	1.67	0.39	0.58	0.54	0.38	0.52	0.22
(n=12)	*m*	60.00	24,00	32.00	19.00	6.00	6.00	11.00	10.00	15.00	8.00	9.00	8.00	27.00	13.00	12.00	20.00	11.50	37.00	7.50	19.00	13.00	7.00	13.00	3.00
	M	113.00	38,00	49.00	33.00	11.00	7.50	20.00	15.00	25.00	16.00	16.00	14.50	40.00	53.00	41.50	30.50	19.00	62.00	13.00	26.50	20.00	13.00	20.00	6.00

Table 2. Percents (%) of some morphometric lengths of species by standard length (*Sl*) and head length (*lc*), $\bar{x}$: mean, ±: Standard Deviation, *m*: Minimum, M: Maximum

			Sl%											*lc%*			
Species		*Sl* (mm)	*lc*	*H*	*pD*	*poD*	*lpc*	*hD*	*lD*	*lP*	*lV*	*hA*	*lA*	*prO*	*Oh*	*poO*	*io*
Capoeta banarescui (n=12)	$\bar{x}$	99.25	25.58	22.16	52.97	39.42	19.97	23,17	15,18	21,73	18.84	21.85	9.76	33.53	26.95	52.11	43.59
	±	3.23	0.60	0.25	0.44	0.31	0.48	0,66	0,49	0,93	0.38	0.73	0.23	0.73	0.77	0.97	0.99
	m	75.00	22.86	20.95	51.00	37.35	16.19	20,95	13,21	15,96	17.00	19.00	8.43	28.57	20.00	45.71	37.14
	M	115.00	30.43	23.48	56.52	41.67	22.02	28,70	20,00	28,92	21.88	28.30	11.00	38.46	30.43	57.14	48.08
Barbus tauricus (n=12)	$\bar{x}$	90.92	27.38	22.35	52.81	40.72	21.94	22.58	15.30	20.66	19.86	19.99	10.25	44.43	26.88	46.50	37.89
	±	2.26	0.28	0.22	0.48	0.36	0.23	0.41	0.30	0.33	0.30	0.59	0.32	0.70	0.48	0.77	0.57
	m	80.00	25.77	20.83	50.60	37.98	20.19	19.59	13.54	18.75	17.71	17.01	8.65	40.74	24.07	40.74	34.04
	M	104.00	29.35	23.20	55.43	42.86	23.26	24.10	17.68	22.56	21.59	23.91	12.50	48.94	29.79	51.06	40.43
Rhodeus amarus (n=12)	$\bar{x}$	52.50	28.23	40,58	58.53	34.97	30,16	22.36	23.92	21.06	19.57	20,09	20,80	36.84	40.79	51.94	47,15
	±	1.30	0.45	0,53	1.18	0.80	0,80	0.55	0.43	0.47	0.38	0,98	0,53	0.59	1.14	1.65	0,70
	m	46.00	26.09	37,50	53.85	28.07	26,60	19.15	21.28	17.65	16.98	16,67	16,67	33.33	36.67	38.71	40,63
	M	62.00	31.91	43,40	68.09	38.30	34,78	26.09	27.27	23.40	21.74	27,66	23,40	40.00	50.00	60.00	50,00
Alburnus derjugini (n=12)	$\bar{x}$	90.67	26.49	21.59	56.95	37.06	21.66	19.41	14.93	20.12	15.62	14.66	19.58	33.72	35.46	47.83	35.98
	±	3.18	0.42	0.39	0.56	0.45	0.46	0.36	0.75	0.27	0.27	0.28	0.36	0.81	0.47	1.64	1.04
	m	79.00	23.36	19.41	51.22	35.29	18.69	17.05	11.73	18.69	14.02	13.08	17.61	28.57	33.33	40.48	29.17
	M	112.00	29.07	24.39	58.82	40.91	24.05	20.93	20.35	21.43	17.07	16.46	21.95	40.00	38.10	61.82	42.86
Vimba vimba (n=10)	$\bar{x}$	96.20	27.90	27.20	54.41	40.30	17.54	22.69	14.72	19.89	16.53	16.32	21.06	36.78	30.23	49.64	39.06
	±	2.54	0.22	0.37	0.50	0.41	0.57	0.37	0.24	0.35	0.39	0.61	0.52	0.44	0.41	1.72	0.78
	m	76.00	26.73	24.74	51.55	38.24	14.56	20.45	13.40	18.56	14.47	12.50	18.18	33.33	28.00	42.59	32.73
	M	110.00	28.95	29.13	58.33	43.16	21.05	24.51	16.34	22.34	19.15	20.21	25.00	38.89	32.76	64.29	42.59
Squalius orientalis (n=12)	$\bar{x}$	107.25	28.24	23.50	55.32	38.43	23.98	19.70	12.38	18.84	16.47	16.65	12.71	31.17	27.10	55.05	44.22
	±	3.93	0.31	0.66	0.44	0.38	0.38	0.37	0.36	0.66	0.39	0.33	0.54	0.83	0.47	0.86	0.76
	m	91.00	26.50	16.81	53.17	35.87	20.79	17.09	9.73	14.96	15.08	14.39	9.85	25.64	24.36	50.00	38.46
	M	132.00	29.67	26.24	59.34	41.03	26.55	21.98	14.29	24.75	20.35	18.48	15.93	34.85	29.63	59.68	50.00

Table 2. (*Continued*)

Species		*Sl* (mm)	*Sl%*														*lc%*			
			lc	*H*	*pD*	*poD1*	*poD2*	*lpc*	*hD1*	*hD2*	*lD1*	*lD2*	*lP*	*lV*	*hA*	*lA*	*prO*	*Oh*	*poO*	*io*
Salmo rizeensis		53.33	30.60	24.94	51.68	48.79	-	22.81	21.60	-	18.72	-	23.18	19.28	18.97	14.91	29.72	35.36	61.43	36.10
(n=12)		1.42	0.77	0.40	0.64	1.26	-	0.82	0.59	-	0.50	-	0.36	0.82	0.33	0.44	0.74	0.97	1.69	1.41
		43.00	24.07	23.00	50.00	42.19	-	18.42	16.00	-	16.00	-	21.05	14.04	17.19	12.00	25.81	30.56	53.33	29.41
		64.00	34.88	27.91	58.14	58.00	-	27.91	24.42	-	23.08	-	25.58	25.00	20.93	17.31	35.29	42.31	76.92	50.00
Neogobius fluviatilis	$\bar{x}$	30.02	30.84	18.12	34.85	57.94	21.87	19.18	17.49	16.61	14.17	36.84	23.41	16.84	12.26	31.60	38.19	25.73	54.77	21.01
(n=10)	±	0.89	0.24	0.37	0.36	0.56	0.33	0.47	0.36	0.44	0.28	0.57	0.38	0.92	0.36	0.40	0.36	0.73	1.67	0.78
	m	25.00	29.63	15.48	32.38	54.32	19.64	16.19	14.71	13.33	12.50	33.33	21.81	12.77	10.64	29.76	36.36	22.03	45.83	17.31
	M	34.00	32.35	20.00	36.76	61.96	23.91	21.74	19.02	19.02	15.56	40.66	25.00	22.22	15.28	33.70	40.74	31.82	69.23	25.93
Ponticola turani	$\bar{x}$	28.42	33.39	20.54	37,47	48.48	24.49	21.30	15.43	15.76	15.45	39.96	24.15	19,49	12.90	27.51	32.15	27.10	55.81	16.58
(n=12)	±	0.99	0.99	0.57	0,77	3.81	4.02	0.72	0.50	0.52	0.81	0.75	0.59	0,42	0.23	0.62	0.60	1.32	2.40	0.78
	m	24.00	26.39	17.05	33,33	18.06	14.16	17.70	13.33	12.35	8.85	35.40	20.99	16,81	11.50	23.45	27.27	21.21	43.64	14.29
	M	38.00	38.73	25.00	41,94	59.68	55.56	25.81	18.06	18.06	18.55	45.00	27.78	21,67	14.29	31.67	36.00	39.47	78.95	24.00

Table 3. Comparisons of the ratios of morphometric measurements belonging to some species different studies and in this study results; Standard Length- *Sl* Standart Length/Body depth (Max.) - *Sl/H*. Standard Length/Length of Head- *Sl/lc*. Standard Length of Head/Horizontal diameter of Eye- *lc/Oh*. Length of Head/Interorbital Distance- *lc/io*. Interorbital Distance/Horizontal diameter of Eye- *io/Oh*. (Studies S0:This Study S1: Bostancı et al. (2015), S2: Bostancı et al. (2016b); S3: Uğurlu and Polat (2006), S4: Uğurlu and Polat (2007), S5: Uğurlu and Polat (2008a), S6: Yılmaz (2016), S7: Uğurlu et al. (2008), S8: Bostancı et al.(2016a), S9: Turan et al. (2005), S10: Uğurlu and Polat (2008b)

Capoeta banarescui				***Neogobius fluviatilis***						
	S1, n=40	S2, n=67	**S0, n=12**	S2, n=23	S3, n=2	S4, n=5	S5, n=17	S6, n=11	S7, n=5	**S0, n=11**
Sl (mm)	94.00-153.00	65.00-136.00	**75.00-115.00**	65.00-100.00			36.00-116.00	80.00-112.00	51.00-106.00	**68.00-105.00**
Sl/H	4.74-6.03	4.45-6.05	**4.26-4.77**	4.93-6.95	5.39-6.11	5.25-5.99	5.51-6.23	5.34-6.22	5.02-6.35	**5.00-6.46**
Sl/lc	4.21-5.13	4.03-5.01	**3.29-4.38**	3.50-496	3.49-3.57	3.49-3.60	3.40-3.62	3.52-3.84	3.47-3.61	**3.09-3.38**
lc/Oh	3.81-6.67	3.92-5.97	**3.29-5.00**	4.08-5.93	4.06-5.32	4.46-5.46	4.08-5.49	4.88-5.12	4.38-5.56	**3.14-4.54**
lc/io	-	-	**2.08-2.69**	-	8.07-8.49	8.50-9.51	8.02-10.57	8.98-9.80	8.79-9.50	**3.86-5.78**
io/Oh	1.52-3.19	1.51-2.57	**1.33-1.92**	1.00-2.40	0.53-0.63	0.49-0.58	0.46-0.62	0.46-0.62	0.55-0.62	**0.64-1.00**

Barbus tauricus										
	S1, n=23.	S2, n=22	S3, n=1	S4, n=23	S5, n=70	S6, n=54	S8, n=30	S9, n=27	S10, n=7.	**S0, n=12**
Sl (mm)	82.00-149.00	71.00-127.00	-	-	58.00-132.00	80.00-165.00	82.00-178.00	-	102.00-122.00	**80.00-104.00**
Sl/H	5.10-5.68	4.34-5.59	4.32	4.67-4.89	4.59-5.26	4.42-5.23	4.53-6.53	3.10-4.42	3.68-4.02	**4.31-4.80**
Sl/lc	3.80-4.20	3.64-4.81	3.79	3.74-4.00	3.68-4.23	3.71-4.22	3.20-4.60	3.91-4.82	3.88-4.23	**3.41-3.88**
lc/Oh	5.36-8.23	3.69-5.88	3.82	3.90-4.73	3.75-5.71	4.03-5.71	4.49-9.13	-	3.01-3.16	**3.36-4.15**
lc/io	-	-	3.41	2.80-4.34	2.86-4.29	2.94-4.32	-	-	3.40-3.64	**2.47-2.94**
io/Oh	1.00-3.19	1.18-1.86	1.12	1.12-1.25	1.23-1.55	1.11-1.56	1.38-3.19	1.42-2.24	1.07-1.13	**1.33-1.50**

Vimba vimba									
	S1, n=76	S3, n=8	S4, n=27	S5, n=3	S6, n=11	S7, n=30	S8, n=38	S9, n=7	**S0, n=10**
Sl (mm)	83.00-165.00			96.00-105.00	76.00-145.00	79.00-210.00	83.00-174.00	102.00-122.00	**76.00-110.00**
Sl/H	3.47-5.23	3.83-4.02	3.72-3.81	3.95-4.08	3.48-4.06	3.34-4.08	3.81-5.89	3.68-4.02	**3.43-4.04**
Sl/lc	3.41-4.18	3.91-4.10	4.01-4.50	3.93-402	3.93-4.23	4.33-4.52	3.74-4.68	3.88-4.23	**3.45-3.74**
lc/Oh	3.12-5.17	3.03-3.28	2.98-3.57	3.12-3.42	3.02-3.40	3.07-3.44	3.27-5.68	3.01-3.16	**3.05-3.57**
lc/io	-	3.08-3.43	2.94-5.59	3.14-3.17	3.10-3.54	3.06-3.24	-	3.40-3.64	**2.35-3.06**
io/Oh	1.12-1.83	0.89-1.00	1.06-1.15	1.04-1.08	1.02-1.15	1.07-1.12	1.14-1.96	1.07-1.13	**1.13-1.43**

Table 4. Comparisons with the ratios of some morphometric measurements of some species obtained in different studies and in this study results in terms of % of Standard Length- *Sl* and head length-*lc*.

	Capoeta banarescui				*Barbus tauricus*				
	Özdemir (2015), Çoruh Basin, n=15, *Capoeta*	Özdemir (2015), Kızılırmak Basin, n=28, *Capoeta*	Schöter et al. (2009), Göksu River, n=10, *Capoeta turani*	In this study, n=12	Bănărescu and Bogutskaya (2003), n=12 Salgir River, *B. tauricus*	Bănărescu and Bogutskaya (2003), n=20 Pursak River-Eskişehir, *B. tauricus kubanicus*	Bănărescu and Bogutskaya (2003), n=22, Alma River-Ukraine, *B. tauricus tauricus*	Verep et al. (2006), n=238, Rize-Artvin Rivers	In this study, n=12
Sl			107.50-128.00	75.00-115.00	68.2-181.00	133.50-279.00	111.00-122.00	54.00-198.00	80.00-104.00
Sl%									
lc	21.10-25.00	21.00-25.70	22.90-23.60	22.86-30.43	25.60-29.60	25.10-31.80	26.30-29.60	19.72-30.51	25.77-29.35
H	21.70-24.50	18.00-25.70	26.60-27.80	20.95-23.48	20.50-24.10	19.20-23.60	20.90-24.30	17.13-27.37	20.83-23.20
pD	43.60-47.10	42.70-47.30	49.70-51.30	51.00-56.52	53.70-58.20	51.60-54.90	53.50-57.10	39.98-61.97	50.60-55.43
poD	36.80-42.80	39.30-42.00	52.60-54.10	37.55-41.67	31.40-38.00	32.30-39.50	35.20-39.20	34.62-46.23	37.98-42.86
lpc	19.90-22.90	17.80-22.30	17.10-17.90	16.17-22.02	12.50-17.00	114.80-17.70	11.80-20.00	-	20.19-23.26
hD	23.10-27.10	22.80-28.20	18.30-19.80	20.95-28.70	16.80-22.50	16.50-20.30	15.80-18.30	-	19.59-24.10
lD	16.20-20.40	16.60-21.20	-	13.21-20.00	12.50-15.40	12.20-15.60	11.70-14.00	-	13.54-17.68
lP	18.50-20.70	16.40-20.10	18.40-19.60	15.96-28.92	18.10-20.70	18.00-22.50	15.80-20.40	-	18.75-22.56
lV	15.80-18.40	13.80-17.30	15.80-17.50	17.00-21.88	16.00-19.00	16.60-19.00	14.20-19.40	-	17.71-21.59
hA	19.20-24.90	16.00-21.80	-	19.00-28.30	16.60-21.10	15.00-20.80	16.30-20.60	-	17.01-23.91
lA	7.70-12.60	8.80-11.90	-	8.43-11.00	7.20-9.00	7.50-8.90	7.10-7.87	-	8.65-12.50
lc%									
prO	30.90-36.80	28.50-37.20	33.10-35.50	28.57-38.46	35.70-42.00	41.00-47.00	42.80-47.00	-	40.74-48.94
Oh	16.60-22.20	17.40-21.80	17.50-19.30	20.00-30.43	12.30-20.40	11.30-14.60	12.70-16.30	-	24.07-29.79
poO	48.00-52.60	46.20-50.20	46.90-48.60	45.71-57.14	43.40-49.00	44.10-50.50	42.80-47.00	-	40.74-51.06
io	34.40-40.60	33.60-38.80	38.80-42.60	37.14-48.08	26.50-32.20	26.20-30.60	28.60-32.60	-	34.04-40.43

Table 4. (*Continued*)

	Alburnus derjugini				*Squalius orientalis*				*Neogobius fluviatilis*		*Ponticola turani*	
	Özuluğ and Freyhof (2007a), *A. demiri*	Özuluğ and Freyhof (2007b), *A. attalus*	Özuluğ and Freyhof (2007b), *A. battalgilae*	In this study, n=12,	Özuluğ and Freyhof (2011), n=10, *S. carinus*,	Özuluğ and Freyhof (2011), n=10, *S. cii*,	In this study, n=12,		Kovačić and Engin (2008), *N. rizeensis*, n=2	In thsi study, n=10	Kovačić and Engin (2008), *N. turani*, n=2	In thsi study, n=12
Sl	49.30-94.10	78.00-51.70	75.70-108.00	79.00-112.00	-	-	91.00-132.00	***Sl***	104.10-124.00	25.00-34.00	64.80-82.50	24.00-38.00
Sl%								***Sl%***				
lc	23.40-26.00	23.90-24.60	22.50-24.80	23.36-29.07	27.00-28.90	24.50-28.00	26.50-29.67	***lc***	28.50-32.70	29.53-32.35	29.20-30.80	26.39-38.73
H	25.90-28.20	21.20-23.30	18.90-23.10	19.41-24.39	23.50-27.90	24.10-29.20	16.81-26.24	***H***	19.20-21.40	15.48-20.00	21.20-21.80	17.05-25.00
pD	56.90-60.80	54.00-55.50	54.20-57.30	51.22-58.82	53.40-57.30	53.40-57.40	53.17-59.34	***lpc***	17.50-19.80	16.19-21.74	26.40-29.10	17.70-25.81
poD	32.60-35.40	-	-	35.29-40.91	35.00-38.00	34.60-38.30	35.87-41.03	***hD1***	12.90-14.30	14.71-19.02	12.70-15.90	13.33-18.06
lpc	18.10-19.90	19.60-21.00	8.30-9.80	18.69-69.77	18.50-22.80	18.70-22.30	20.79-26.55	***hD2***	17.10-18.30	13.53-19.02	15.10-16.10	12.35-18.06
hD	18.60-20.80	-	-	17.05-20.93	-	-	17.09-21-98	***lD1***	17,30	12.50-15.56	14.70-16.20	8.85-18.55
lD	-	17.60-20.80	17.00-20.10	11.73-20.35	-	-	9.73-14.29	***lD2***	35.70-36.00	33.33-40.66	35.50-36.20	35.40-45.00
lP	19.00-20.80	18.40-19.40	17.30-19.70	18.69-21.43	17.60-20.60	15.50-19.50	14.96-24.75	***lP***	22.80-24.00	21.81-25.00	26.10-26.30	20.99-27.78
lV	14.70-16.80	13.50-15.20	12.90-15.40	14.02-17.07	14.90-16.90	14.20-17.00	15.08-20.35	***lV***	15.80-16.90	12.77-22.22	17.90-18.10	16.81-21.67
hA	-	-	-	13.08-20.35	-	-	14.39-18.48	***hA***	-	10.64-15.28	-	11.50-14.29
lA	16.00-19.00	15.70-16.10	14.60-17.70	17.61-22.09	-	-	9.85-15.93	***lA***	23.80-24.20	29.76-33.70	24.60-25.20	23.45-31.67
lc%								***lc%***				
prO	24.40-30.40	27.40-28.80	28.90-32.40	28.57-40.00	29.70-33.80	48.10-54.39	25.64-34.85	***prO***	28.20-29.20	36.36-40.74	29.10-31.70	27.27-36.00
Oh	26.90-29.70	26.40-27.60	22.30-26.90	33.33-38.10	19.20-24.00	18.60-23.90	24.36-29.63	***Oh***	15.60-15.90	22.03-31.82	19.70-21.70	21.21-39.17
poO	44.00-47.80	-	-	40.48-61.82	48.00-53.40	48.30-55.10	50.00-59.68	***poO***	16.80-18.20	45-83-69-23	46.60-51.20	43.64-78.95
io	27.10-28.80	29.20-31.50	28.10-34.60	29.17-42.86	30.10-35.60	35.20-39.90	38.46-50.00	***io***	-	17.31-25.93	-	14.29-24.00

There are similarities between the diagnostic characteristics of all species identified in the Ilıca River and similar species found in other studies in which these species have been identified. The use of morphometric data in comparisons is also important in species analysis. Especially when a new species is found, the ratios between the morphometric characters in the world fish taxonomy are accepted as important data. Metric ratios appear to play a very important role in the identification of endemic species (Küçük et al., 2013; Turan et al., 2014; Ekmekçi et al., 2015; Turan et al., 2016). The measurements given in Tables 1, 2 and 3 are presented in novel taxonomic studies in Turkey, and it is considered to be important for comparison in subsequent studies to be carried out in this river. Nevertheless, the use and analysis of morphometric rates such as *Sl*% and *lc*% have not yet become widespread, despite the emphasis on meristic characters in the vast majority of examined national articles.

As a result, nine fish species determining to Ilıca River in this study are not endemic species and most of them are found in the Black Sea Region and a few are spread over wide areas in Turkey. *Barbus tauricus* is an endemic species of the Crimea peninsula, as well as many other rivers that have flowed into the Black Sea. According to Bănărescu and Bogutskaya (2003) suggested that subspecies, *B. t. escherichi* exists in Black Sea Basin except Crimea. It has also been reported in Turkey that there is some inland waters (Iznik Lake, Biga Peninsula and some freshwaters in Western Black Sea) (Özuluğ et al., 2005; Sarı et al., 2006; İlhan and Balık, 2008). However, this subspecies name is not valid today and is accepted as *B. tauricus* (Froese and Pauly, 2016). In Turkey, *Alburnus derjugini* is found in very few places in the Black Sea. The *Ponticola turani* is also understood to be found in the inland waters of the Black Sea region, such as *A. derjugini*, *Capoeta banarescu*, as seen this study in the Ilıca River and the Çoruh River flowed into the Black Sea (Bayçelebi et al., 2015). It was reported that *Squalius orientalis* lives in three regions in Turkey (Deriner Dam Lake and Dicle River Upper Basin) with this study. *Salmo rizeensis*, one of the endemic salmonid species in the Black Sea region, is also a new register for this river.

The number of fishes living in the inland waters of Turkey increases day by day with many works done. It is an undeniable actuality to be found new records and endemic new species if it is thought that there are many streams, brooks and ponds etc. where have not yet been discovered as ichthyo-faunistic in Turkey. However, unlike only one reference book written by Geldiay and Balık (2009) that identifies the freshwater fishes in Turkey, there is a need for a source book described freshwater fishes in a modern meaning. It will be beneficial to initiate such cataloging work in terms of introducing endemic and locally living species to future generations and in terms of knowing the ichthyodiversity and revealing endangered or critically endangered species of Turkey.

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